

<b>Notice of Allowability</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/759,962	GIDWANI, JAWAHAR M.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Thomas K. Pham	2121	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment filed 11/21/2005.
2. ☒ The allowed claim(s) is/are 2-4, 9-11 and 13-22.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |  |
|---|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892)  | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment                    |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance   |
|   | 9. <input type="checkbox"/> Other _____.   |

### EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Ms. Eunhee Park on 12/05/2005.

The application has been amended as follows for claim 16:

16. (currently amended) The method of claim 9, further including: ~~A computer-implemented method for analyzing a structure comprising:~~  
classifying a plurality of structures according to predetermined structure types;  
sub-classifying the structures within each classified structure type by fundamental structure periods;  
determining damage functions for the sub-classified structures; and  
storing the determined damage functions.

***Reasons for Allowance***

2. Claims 2-4, 9-11 and 13-22 are allowed.
3. The following is an examiner's statement of reasons for allowance:

While Horiuchi (U.S. Patent No. 5,388,056) discloses a vibration testing system that has high precision in realizing an equivalent test condition for testing an entire structure, which can accurately evaluate earthquake or vibration response of a large structure by exciting only a portion of the structure in a short period of time. Horiuchi does not teaches at least global damage measure including one or more of a global displacement ductility and number of damaged members, regional damage measure including one or more of inter-story drifts, inter-story shears, number of damaged members in a region, and identification of damaged members; and local damage measure including one or more of maximum member ductilities, cumulative member ductilities and number of cycle reversals; and other limitations related to these features in combination with the remaining elements and features of the claimed invention.

And D'Ambrisi ("Modeling of Cyclic Shear Behavior in RC Members") discloses an improved analytical methods for simulating the nonlinear static and dynamic response of reinforced concrete frames. The methods discloses a formation of local stiffness matrix as applied to reinforced concrete members where it divides the local stiffness into sub-elements and assembles the sub-elements to form only the local stiffness matrix. D'ambrisi does not teach the step of analyzing includes at least two or more of using a minimization technique to minimize the storage requirements of a global stiffness matrix and local stiffness matrix; using a numerical solution technique that requires only one copy of the global stiffness matrix; reformulating and reducing only a portion of a global stiffness matrix that changes due to change in member state;

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using a sufficiently higher order integration method to increase the step size thereby reducing the number of steps required for analysis; and other limitations related to these features in combination with the remaining elements and features of the claimed invention.

Neither of these references taken either alone or in combination discloses a computer-implemented method for analyzing a structure having all the claimed features of applicant's instant invention, specifically including: at least global damage measure including one or more of a global displacement ductility and number of damaged members, regional damage measure including one or more of inter-story drifts, inter-story shears, number of damaged members in a region, and identification of damaged members; and local damage measure including one or more of maximum member ductilities, cumulative member ductilities and number of cycle reversals, wherein the step of analyzing includes at least two or more of using a minimization technique to minimize the storage requirements of a global stiffness matrix and local stiffness matrix; using a numerical solution technique that requires only one copy of the global stiffness matrix; reformulating and reducing only a portion of a global stiffness matrix that changes due to change in member state; using a sufficiently higher order integration method to increase the step size thereby reducing the number of steps required for analysis. Also, there is no motivation to combine the Horiuchi reference with the D'Ambrisi reference to meet these limitations. It is for these reasons that applicant's invention defines over the prior art of record.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner *Thomas Pham*; whose telephone number is (571) 272-3689, Monday to Thursday from 6:30 AM - 5:00 PM EST or contact Supervisor *Mr. Anthony Knight* at (571) 272-3687.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**Thomas Pham**  
*Patent Examiner*



December 5, 2005



**Anthony Knight**  
**Supervisory Patent Examiner**  
**Group 3600**